Geographic miss and very late stent thrombosis

Geographic miss leading to neoatherosclerosis and very late stent thrombosis

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Case description

We describe the case of a 72-year-old man, who had a history of percutaneous coronary intervention (PCI) of the mid right coronary artery (RCA) with implantation of a 3.5×28 mm biolimus-eluting stent (BES) (Nobori®; Terumo Corporation, Tokyo, Japan) for symptomatic angina (fig. 1A and B). Three years later, he presented to our institution with an inferior ST-elevation myocardial infarction (STEMI). The subsequent angiogram revealed a very late stent thrombosis (fig. 1C) of the mid RCA. On optical coherence tomography (OCT), we encountered an acute plaque rupture within a segment of neoathersoclerosis at the distal exit of the previously implanted BES (fig. 1D, segments 1–3). This was subsequently treated with a 3.5×28 mm eveorlimus-eluting stent (Xience Sierra®; Abbott Vascular, Santa Clara, CA). The patient recovered well and had an uneventful follow-up.

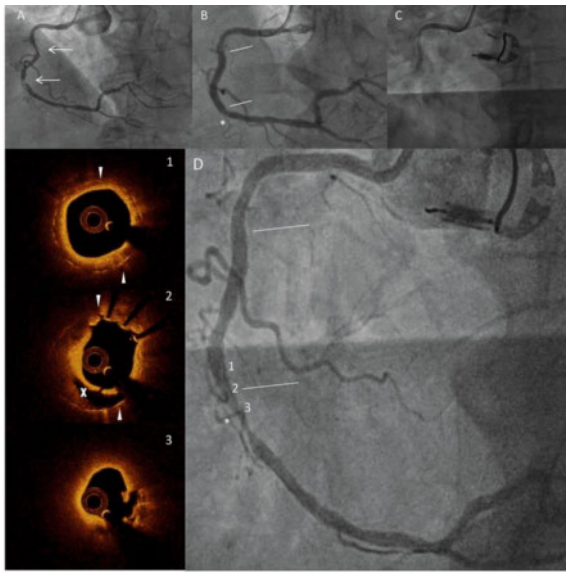

Figure 1: Coronary angiography and optical coherence tomography (OCT) of the lesions. (A) Initial coronary angiography showing the two tandem lesions (each 95% stenosis) in the mid right coronary artery (RCA) (white arrows). (B) RCA after stenting with one biolimus-eluting stent (BES): segment covered by the stent (white lines); the distal plaque is left uncovered (*). (C) Second coronary angiography with complete occlusion of the mid RCA due to stent thrombosis (TIMI 0 flow). (D) Mid-RCA lesions: area formerly covered by the BES (white lines) and uncovered area (*). The corresponding frames from OCT pullback (1–3) are depicted on the left. Neoatherosclerosis (cross) and stent struts (arrowhead) are highlighted.

Identifying the exact mechanism of stent thrombosis by use of intravascular imaging is crucial and is therefore recommended by the latest guidelines [1]. Our case implies that geographic miss with incomplete coverage of the initially treated coronary lesion promoted development of neoatherosclersosis, which ultimately led to very late stent thrombosis. This assumption is also supported by the initial angiogram (fig. 1B), which suggests implantation of a stent not completely covering the lesion.

Geographic miss is a frequent cause of adverse outcomes after stent implantation, especially in the setting of diffusely diseased vessels and complex lesions treated with angiographic guidance only. In this context, the use of intravascular imaging, particularly OCT, can improve stent implantation results and long-term clinical outcomes.

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Disclosure statement
MM, GMC, AA and RK report no conflict of interest. FC has received consulting and speaker fees from SIS Medical and Abbott Vascular. MB has received consulting and speaker fees from Amgen, Astra Zeneca, Bayer and Mundipharma.

Reference

1 Neumann, F.J., et al., [2018 ESC/EACTS Guidelines on myocardial revascularization. The Task Force on myocardial revascularization of the European Society of Cardiology (ESC) and European Association for Cardio-Thoracic Surgery (EACTS)]. G Ital Cardiol (Rome), 2019. 20(7-8 Suppl 1): p. 1S-61S.

Published online first – please cite as: Cardiovasc Med. 2022;25:w10122. doi: 10.4414/cvm.2022.w10122 EMH Media